EPRI | ELECTRIC POWER RESEARCH INSTITUTE

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October 13, 2005

California Energy Commission Dockets Unit
Attn: Docket No. 04-IEP-1K
1516 Ninth Street, MS-4
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Re: **04-IEP-1K Committee Draft Document Hearings**

Dear Commissioners John L. Geesman and James D. Boyd:

The Electric Power Research Institute (EPRI) is pleased to submit the following comments with respect to the 2005 Draft Integrated Energy Policy Report (Draft Energy Report).

EPRI is impressed with the thoughtful work accomplished by the Integrated Energy Policy Report Committee and documented in the Draft Energy Report. We will provide comments on the following topics:

- Clean coal
- Nuclear
- Distributed generation
- Demand response
- Renewable energy

Clean Coal

EPRI believes that a diverse electricity portfolio of supply and demand options is a strong strategy for providing affordable, secure, reliable, and environmentally-acceptable electricity. Natural gas provides a major fraction of California's electricity at 45%, compared to less than 20% for the nation, potentially significantly impacting the availability of affordable electricity for Californians. While California's loading order ensures that demand options and renewable and distributed energy are part of the electricity portfolio, California should also consider coal-generated electricity to balance the electricity supply options for security and affordability.

EPRI agrees that California has an opportunity to provide leadership to the Western States to promote fuel diversity for electricity generation by developing and defining policies focused on broadening California's electric generation fuel options.

EPRI recommends research and analysis to determine the viability of clean coal for California and the Western states. We recommend conducting comprehensive research and analysis of the economic and environmental impacts of the following:

- Coal technology options (building on existing work, such as EPRI's CoalFleet for Tomorrow program). EPRI agrees with the CEC that future deployment of coal power systems should include the consideration and adoption of many different technologies to ensure that California is able to capitalize on "best fit" technologies. EPRI strongly recommends a broad definition of clean coal technology to include not only integrated

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gasification combined cycle (IGCC), but also other technologies such as pulverized coal combustion with super critical and ultra-super critical steam cycles which significantly increase efficiency, and circulating fluidized bed combustion. While Governor Schwarzenegger's response to the 2004 Energy Report Update, "It is not possible to predict which technologies will advance to commercially maturity most rapidly," is valid, EPRI has found that coal variations will also drive technology choices due to performance and economics.

- The use of indigenous fuels, including petroleum coke and coal.
- The production of the multiple products from gasification and advanced coal combustion in addition to power, such as super clean diesel and jet fuel from Fischer-Tropsch synthesis, hydrogen, and CO_2 for enhanced oil recovery.
- Generating locations including in state and out of state. Consideration should be given to co-locating in-state coal or petroleum coke generating facilities near remote renewable electricity supply to optimize the value of the generating stations (for example, to dampen wind intermittence) and to increase the value of transmission investments (for example, to supply network benefits.) Costs of transmission enhancements should be included in the analysis.
- Integrating advanced cooling technologies such as degraded water and dry cooling options.

The analysis should also consider how to cost-effectively manage greenhouse gases from coal to emit no more than from a new combined-cycle natural gas turbine. Options may include biomass cofiring, super efficient units, and partial CO2 removal.

EPRI notes that in our research, we have found that it may be more cost-effective to wait for carbon management policies to be set rather than design in hardware modifications now to accommodate carbon capture and storage later. However, some modifications are cost effective to implement now, such as leaving space for carbon capture equipment. EPRI recommends that designs for advanced coal plants in the near term include cost-effective accommodation for carbon capture.

Nuclear

Nuclear energy provides another opportunity for California to create a more balanced and secure electricity supply portfolio. California already benefits from four operating nuclear plants that provide low cost, reliable and emission-free electricity to approximately 13% of California consumers. License renewal for those four plants would extend these benefits for another 20 years.

Nuclear energy should be considered as part of the portfolio of future options. The future nuclear option offers some tangible benefits such as energy security, reliability, cost and environmental quality. Based upon our own technical assessment we are more optimistic about the prospects for success in completing the licensing and construction of a spent fuel repository at Yucca Mountain than is reflected in the draft report (pages 71-73). EPRI believes that conditions will emerge that would satisfy the stipulations of the moratorium within the next

decade or so. Therefore, it would be prudent to allow for a nuclear option subject to that contingency in current loading order.

Distributed Generation

EPRI applauds the Energy Commission's recommendation that the state examine regulatory incentives that reward utilities for promoting customer- and utility-owned combined heat and power (CHP). The lack of utility business incentive is indeed a major barrier to customer-owned CHP. The Draft Energy Report cites success in the energy efficiency arena in California to keep utilities revenue-neutral with mechanisms such as the Earned Rate Adjustment Mechanism. This merely removes a disincentive and already exists in California. Utility shareholder earnings have been decoupled from electricity sales revenues in California since the 1980s.

To achieve proactive utility business initiatives to encourage customer-owned CHP as well as other forms of distributed generation (DG), California should take additional steps beyond removing the disincentive of revenue loss. As noted in the Draft Energy Report, energy efficiency provides a model for CHP. In California, the following steps have been taken or are planned for energy efficiency:

1. Decouple profits from sale of electricity (achieved in the 1980s)
2. Allow recovery of energy efficiency program costs by the utilities (approved by CPUC on 9/22/05).
3. Develop an incentive approach, such as a mechanism for earning a return. This existed in the 1990s for demand-side management. This will be addressed by the CPUC in early 2006.

The first two steps remove disincentives but do not provide incentives to utilities for encouraging energy efficiency beyond the goals set for each utility. With only the first two steps in place, utilities will be compliant with the program and meet goals. The third step goes beyond compliance and encourages innovation and growth in energy efficiency programs.

EPRI recommends the same thinking be applied to CHP and DG regulatory models.

Above all, EPRI recommends that the CHP and DG to be encouraged should bring value to the power delivery system and to society as a whole. For example, the CHP or DG may reduce total cost of electricity, reduce the impact of electricity on the environment, and provide benefits such as capital deferral for infrastructure improvements, or increased reliability and security. We call these win-win distributed energy resources (DER) opportunities. A single project may not provide notable benefits, but several DER projects in a system could provide demonstrable benefits.

Phase 2 of EPRI's Distributed Energy Resources Public/Private Partnership (DER Partnership) will develop regulatory models to create incentives for utilities to encourage DER where it brings value to society. The Energy Commission's Public Interest Energy Research program has been a partner in this program during phase 1 and intends to continue as a partner in phase 2. The

DER Partnership will use a stakeholder collaboration process, which is, we believe, the most effective process to develop workable solutions for win-win outcomes for DER.

Demand Response

EPRI agrees that demand response is a cost-effective approach for reducing peak electricity demand, which could defer the need for additional power plants. The Draft Energy Report recommends rapid deployment of advanced meters to quickly enable demand response. EPRI agrees that advanced meters are critical to the intelligent use of electricity as embodied in programs such as demand response. However, a well-engineered and flexible infrastructure that may take longer to implement will be more cost-effective than a rapidly deployed but limited and potentially inflexible infrastructure.

EPRI is leading a major collaborative research effort, the IntelliGrid Consortium, on transforming the power delivery system to the intelligent grid of the future. The PIER program is a funder and collaborator in this effort. As a result of this effort, EPRI has determined that following a consistent set of guidelines using open architecture based on industry-accepted standards for system enhancements is the cost-effective way to meet today and tomorrow's electricity needs.

Based on these findings, EPRI recommends that California's advanced metering infrastructure (AMI) be created using a statewide open architecture that enables interoperability and is based on industry accepted standards. This will ensure that the investment will be valuable for the life of the equipment and will provide the highest possible level of capabilities for the investment.

EPRI's IntelliGrid Consortium created the IntelliGrid Architecture, a guidebook (available to the public) that provides tools for creating such an infrastructure as the AMI in California. The architecture calls for a number of actions that we recommend should be taken in California:

- With stakeholders, collaboratively develop requirements for the systems that meet today's and tomorrow's needs
    - Engage key stakeholder organizations, including utilities, suppliers, consumers
    - Work with key standards and user groups
    - Ensure systems developed can meet future needs
- Specify interoperability, open architecture, and standards-based system design
- Develop the architecture in California as an industry-level architecture

Potential outcomes of not following a statewide architecture with open architecture and standards-based design include:

- Separate systems across the state that cannot "talk" to each other and would require special interfaces to be developed to enable use at the state level
- Proprietary solutions that could quickly become obsolete
- Lack of a competitive market to encourage product innovation to supply the functions the State wants to see.

EPRI recommends that the Energy Report recommend that the AMI process be revised to address these issues in order to assure:

- That ratepayer funds for this major capital investment are used wisely
- That the infrastructure to be installed will support multiple functions, and
- That the system will provide value to California for the life of the equipment.

Renewable Energy

Wind brings a new set of issues to be addressed, such as integration of this intermittent resource that cannot be counted on but only predicted. The challenges of wind could be overcome through strategic pairing with hydro, which can be stored in some cases (as pumped storage or held back behind a dam), with gas turbines that are underutilized in the market, or with coal generation. These predictable "partners" with wind could make hydro, gas turbine generators, and coal generators more valuable and the wind energy more viable. Research should be conducted in California to consider these strategic partners with wind. The research should include analysis of what hydro or natural gas fired generators are available for partnering, how it would work, changes to the value of wind, and impacts on total electricity portfolio and markets.

We look forward to the outcome of the 2005 Energy Report and continuing to partner with the Energy Commission's Public Interest Energy Research Program to solve California's energy challenges.

Sincerely,

Kevin R. Evans
Senior Vice President & Chief Business Officer
Electric Power Research Institute

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